CHAPTER 3

3.0 EVALUATING THE SCREENING-LEVEL HHRA

3.1 INTRODUCTION

HHRAs performed at the PA/SI stage are typically screening-level in nature and are performed to identify whether a site needs to be assessed further or can be eliminated from further concern. Rarely would a screening-level HHRA provide adequate information to justify remediation. Since the information that is available at this point of a site response is usually limited, a conservative approach is used in performing the assessment.

3.2 SCREENING-LEVEL HHRAs

The basis of the screening-level HHRA is a comparison of site media concentrations (typically, the maximum detected concentration is used) with health-based screening levels, calculated according to RAGS protocol. The recommended values to use for performing this evaluation are those developed by EPA Region 3 (RBC Tables) or Region 9 (PRG Tables), both updated regularly. It is important to note that the RBC and PRG values noted above are not equivalent, as the exposure pathways evaluated are different. Therefore, it is imperative that these values be applied within the context that they were developed. The basis for utilizing these values will be introduced later in this chapter, and presumes an understanding of general risk assessment methodology.

PRGs are not synonymous with RGs. For a complete discussion of the development of site-specific PRGs, and appropriate methodology for calculation of RGs, see RAGS Part B (USEPA, 1991d).

3.2.1 Chemical Data Collection and Review. In order for the screening-level HHRA to achieve the desired objectives, the data applied to the assessment must be appropriate for the intended use. Data that are available from PA/SI activities are usually limited in number, but should be broad in scope of chemical analysis and in the type of media sampled.

3.2.1.1 An important component of the data review for a screening-level HHRA is an evaluation of the representativeness of the data. Sampling should have been conducted in areas of suspected contamination in order to provide information on the "worst case." If sampling was not conducted in areas of suspected contamination, the screening-level HHRA will not provide an adequately conservative assessment of potential risks. Similarly, if a broad chemical analysis was not performed, or if data are not available for all media of potential concern, the usefulness of the screening-level HHRA will be limited and would not be appropriately used to eliminate a site from further consideration.

3.2.1.2 The following factors are minimum requirements for data used in a PA/SI screening-level HHRA:

- Chemical-specific analysis of all environmental media of potential concern (e.g., soil, sediment, surface water, and ground water).
- A broad chemical analysis (or defensible historical information regarding specific COPCs).

3.2.2 Exposure Assessment. Two primary elements of the screening-level HHRA for a PA/SI are the identification of the appropriate receptor group(s) and selection of appropriate exposure point concentrations.

3.2.2.1 Selection of the population group with the highest potential exposure is required in applying the appropriate health-based screening values. Development of the preliminary CSM can be used to identify this group. The EPA regional health-based screening values are based on either residential or occupational exposures.

3.2.2.2 As a rule, the highest detected chemical concentration in a medium is compared with the health-based screening value. However, the range of chemical concentrations detected, as well as the number of samples collected, should be reviewed to determine whether this approach is appropriate. If the screening level HHRA does not provide a clear determination of whether the site can be eliminated from further consideration, further study under an RI (i.e., BRA) is indicated.

3.2.3 Health-Based Screening Levels. As noted earlier, the health-based screening levels calculated by Region 3 and Region 9 are not the same, as they evaluate different exposure pathways. The pathways evaluated are delineated as a lead in to the tables. Note that these values are updated regularly, and care should be taken to assure that the most recent values are used. The Region 3 RBC tables can be accessed on the Internet at http://www.epa.gov/reg3hwmd/risk. The Region 9 PRG tables can likewise be accessed at: http://www.epa.gov/region09/waste/sfund/prg/index.htm

To appropriately use the health-based screening values, the risk assessor must be aware of the assumed exposure pathways and exposure factors used to derive these values. If exposure pathways other than those used for the calculations are anticipated to be significant at a given site, use of the health-based screening values is limited. Other values, developed by other EPA regions may also be appropriate, particularly if the site where the assessment is performed falls within that geographical region.

3.2.4 Risk Screening. To perform the risk screening in a PA/SI, the maximum chemical concentration in each medium is compared with the selected health-based screening level. In general, if the maximum chemical concentration exceeds the health-based screening level, further study of the site is indicated. The range of chemical concentrations detected, the degree of the exceedance of the health-based screening level, and the appropriateness of the value itself should be evaluated as part of the decision-making process in determining whether the site should be eliminated from further concern or if further study is warranted.

3.2.5 Characterization of Uncertainty. The uncertainties associated with a screening-level HHRA should be clearly presented as part of the assessment. The potential effect of the following factors should be discussed:

- Uncertainties associated with the limited chemical data base for the site.
- Use of maximum chemical concentration for representing exposure at the site.
- Use of highest exposure or “worst case” receptors.
- Application of the health-based screening value and the inherent assumptions used in its derivation.